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MEMORANDUM ON THE PRACTICABILITY OF SETTING MAXIMUM STANDARDS OF WORK IN COTTON MILLS OPERATING UNDER THE STRETCH-OUT SYSTEM

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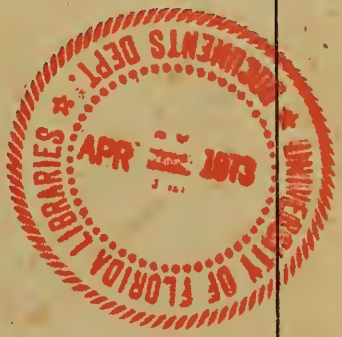

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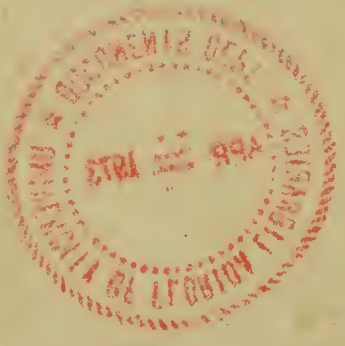

MEMORANDUM ON THE PRACTICABILITY OF SETTING MAXIMUM STANDARDS OF WORK IN COTTON MILLS OPERATING UNDER THE STRETCH-OUT SYSTEM

The following information was obtained from statements of 2 engineers, 1 research organization, 1 textile labor leader, and 1 cotton-mill owner, together with facts obtained by the Women's Bureau.

WEAVING

Summary

The authorities mentioned above agree that because of the tremendous variations within a mill in the several elements of the job it is very difficult to set by law any general limit as to the number of looms that a weaver can operate in a cotton mill. The variations in work, lay-out, machinery, and divisions of jobs differ in each plant. With the same number of looms the task set might be fair in some mills and far too heavy in others. In order to determine a fair number of looms per weaver, a scientific measurement should be made of the work to be done by the weavers in the individual mills on the several fabrics they make, taking into consideration all the elements that influence the job. A definitely set maximum number of looms might be perfectly fair where all the previous steps had been properly taken and the same number far too many without preparatory planning.

A code might be drawn up by experienced textile engineers that would set the proper standard of looms per weaver for the majority of cloth constructions, but such a code should specify also standards of machines and of upkeep, as well as conditions and equipment in departments preliminary to weaving.

It is suggested that under the National Recovery Administration in plants where the stretch-out has been introduced and where such system is considered by the workers to be unfair or to entail very heavy work, a complaint can be made directly to the Administrator, who may then order an investigation by competent engineers. The investigation may be asked for through an organization of workers or by a group in a single mill.

SOME FACTORS INVOLVED IN DETERMINING THE NUMBER OF LOOMS TO A WEAVER

1. The work

- *a.* Grade of cotton.
- *b.* Type of finished goods desired.
- *c.* Quality of finished goods desired.
- *d.* Variability of the management's orders.

2. The machine (in all departments)

- *a.* Type.
- *b.* Condition.
- *c.* Operating.
- *d.* Organization of draft, speed, and twist (carding and spinning).

3. The job (weave room)

- *a.* Average number of loom stops per hour.
- *b.* Weaving system.
- *c.* Responsibility regarding upkeep, cleaning, inspection of goods coming and going, etc.
- *d.* Method of patrol.
- *e.* Skill involved.
- *f.* Motivation.
- *g.* Physique.
- *h.* Health.

4. Working conditions

- *a.* Lighting.
- *b.* Floor.
- *c.* Air conditions.

DOCUMENTS

WORK OF A WEAVER

1. Piecing ends (including starting looms).
2. Walking.
3. Taking off cloth.
4. Filling batteries (sometimes done by a battery hand).
5. Cleaning (generally done by cleaners).
6. Rest time.
7. Miscellaneous.

CAUSES OF WORK VARIATION IN THE WEAVE ROOM

1. Piecing ends. Number of loom stoppages is determined by—

a. Conditions in the picking, carding, and spinning departments.
b. The cloth requirements, such as strength, elasticity, pattern (plain, fancy, colored).
c. Weaving imperfections.
d. Character of yarn.
e. Atmospheric conditions.

2. Walking. The amount is determined by—

a. The system of weaving.
b. The length of the cycle or patrol.
c. The average time allowed for piecing ends, taking off cloth, and other duties.
d. The rest time allowed.

3. Taking off cloth. Time varies with—

a. The character of the cloth.
b. The size of the piece.

4. Filling batteries

a. Whether the operation is performed by the weaver or a battery hand.
b. Time the filling lasts in the shuttle.
c. Arrangement of filling in box.
d. Method of filling battery.
e. Type of loom.

5. Cleaning

a. Cleaning is usually done by cleaners.
b. If cleaning is done by weavers, the time depends on the character of the cloth being woven.

6. Rest time

Generally 10 to 12 minutes per hour should be allowed.

7. Miscellaneous

a. If no special hands, pick-out work.
b. Examining cloth.
c. Extras.

SPINNING

Summary

The problem of establishing a standard of the number of sides a spinner can operate without undue fatigue is similar to that of setting the correct number of looms for a weaver. No definite number of sides can be set that will apply with equal fairness in all mills, because of the multiplicity of factors involved not only in the type of yarn manufactured but in the machinery and method of operating in different mills. The amount of piecing, creeling, and cleaning varies between mills and on different numbers of yarn. The yarn breakage is affected not only by the quality of the yarn desired and the condition of the spinning frames but by the type of machines used and the engineering skill exercised in the picking and carding operations. According to some authorities the greatest obstacle to overcome in order to obtain proper spinning-room operating is the presentation of an even roving of a reasonable twist, and this depends not on the spinning room but on the carding.

The extension or stretch-out of the work has been less generally introduced in the spinning room than in the weaving room. This is probably due to two reasons: First, the wages of a spinner are lower than those of a weaver, so the extension of the work involves less saving in the spinning than in the weaving room; second, the walking

is very much increased, and as the spinners generally are women this often causes considerable dissatisfaction, especially among the cleaners, who walk more and earn less than do the spinners.

It is suggested that a spinning code might be drawn up by experienced textile engineers giving an approximate number of spindles for a spinner working under different methods on certain counts of yarn and a general outline of duties of the spinner. Any such code would of necessity allow for revision and adjustments.

SOME FACTORS INVOLVED IN DETERMINING THE NUMBER OF SIDES PER SPINNER

1. The work

- *a.* Grade of cotton.
- *b.* Number of yarn desired.
- *c.* Quality of yarn desired.
- *d.* Filling or warp yarn.

2. The machine

- *a.* Type.
- *b.* Condition.
- *c.* Upkeep.
- *d.* Organization of draft.
- *e.* Speed and twist.
- *f.* Size of spindle.

3. The job (spinning room)

- *a.* Average number of end breakage per side per hour.
- *b.* Spinning system.
- *c.* Responsibility regarding upkeep, cleaning, creeling, et cetera.
- *d.* Method of patrol.
- *e.* Motivation.
- *f.* Physique.
- *g.* Health.
- *h.* Rest periods.
- *i.* Miscellaneous.

4. Working conditions

- *a.* Floor.
- *b.* Air conditions.
- *c.* Lighting.

WORK OF A SPINNER

1. Piecing ends.
2. Creeling.
3. Cleaning (sometimes done by an assistant).
4. Walking.
5. Resting.

CAUSES OF WORK VARIATION IN THE SPINNING ROOM

1. Piecing ends. Number to be pieced is determined by—

- *a.* Quality of cotton.
- *b.* Count of yarn.
- *c.* Yarn requirements—drafts, speeds, twists.
- *d.* Conditions in the picking and carding rooms.
- *e.* Spinning frames, condition and operation.
- *f.* Type and specification of machines.
- *g.* Build of bobbin.
- *h.* Humidity condition.

2. Creeling

- *a.* Count of yarn.
- *b.* Size of back roving.
- *c.* Bobbin-cleaning machine supplied.
- *d.* Whether spinner carries full and empty bobbins to and from the frames.

3. Cleaning

- *a.* Quality of cotton.
- *b.* Count of yarn.
- *c.* Length of draft.
- *d.* Division of the work.

4. Walking

- *a.* Count of yarn.
- *b.* Size of frame.
- *c.* Method of patrol.

5. Resting

- *a.* Careful planning of work.
- *b.* Method of patrol.
- *c.* Division of work.

OPINIONS EXPRESSED

"End breakage is one of the most useful and measurable factors in the determining of any load and would have a part in any locally set standard. It would, however, be impossible on this basis alone to lay down a tabulated requirement as to a machine assignment, because of the many other factors that contribute to the hardship of the work."

A few of the many facts that should be known before a task is set are, whether a weaver must fill his own batteries, remove the finished cloth, draw in without help after smashes, and clean the looms; also the method of patrol. For almost all of these there are degrees of variation, and not merely yes or no.

Even though the new system is developed under engineers, the workers should be consulted and informed, as far as possible, of the aim and the methods used to achieve it. One engineer said, "The most important and lasting results come from the development of suitable processes of association and not from imposed rulings. It is more useful and a far better use of human forces to set up standard-setting processes by which those affected get a hand or voice in the findings which are to guide them."

RECOMMENDATIONS

1. The job should be laid out as scientifically as possible by competent engineers, with a careful measurement made of work to be done in the individual mills, taking into consideration all the elements that influence the job. When the stretch-out follows a standard number of looms or spindles set for a certain product, type of machine, and method of work, the operations in preceding departments should follow the procedure outlined by the best engineering practice.

2. The job should be laid out on the basis of time required to do the work; but as it takes time and some experimenting to reach a fair standard, a sliding scale should be laid out until the final standard has been achieved.

3. The type and quality of the management should be considered in the setting of any job standard. The ability to carry on a system after a standard has been set is of vital importance to the success or failure of any plan.

4. As in most cases the engineers are hired by the management and represent it, there should be some machinery set up whereby complaints of the workers may be submitted to an outside impartial body having a thorough knowledge of the textile industry. The importance of having the worker understand the change and of obtaining his cooperation cannot be overestimated.

5. The task should be set to allow for a reasonable amount of rest time, probably an average minimum of 12 minutes an hour. This rest time cannot, of course, be taken in a single period, but the work should be planned to allow for at least that amount of free time. This amount of rest time is not final, as further research may establish a different scale in order to prevent undue fatigue.

6. The duties included in the new system should be in writing to minimize misunderstandings and as a basis for future adjustments.

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